

ON THE GENUS HALOBATES FROM JAPANESE AND FORMOSAN COASTS (HEMIPTERA: GERRIDÆ).

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Of that well known pelagic genus of Hemiptera, *Halobates*, only two species have hitherto been recorded from the seas adjacent to Japanese islands. Recently, four more species, all apparently new, have come under my observation, thus giving in all six species to the *Halobates*-fauna of the same region.

Before describing these new species, it may be pointed out that the hind tarsus of this genus is two-jointed, instead of being one-jointed. The alleged one-jointedness of the hind tarsus has been considered as an important generic character of *Halobates* by many entomologists, except Dahl, who states that "Die Tarsen sind ebenfalls zweigliedrig" (Plank. Exped., Humboldt-Stiftung, Bd. 2, p. 2, 1893). The hind tarsi of all the species studied by me are two-jointed, as in all the other genera of the Family Gerridæ. This point is often difficult to make out, because of the fact that the joints are extremely slender and pubescent. In newly moulted specimens, however, the two-jointedness is readily recognizable.

***Halobates apicalis* sp. nov. (Fig. A).**

Body ashy gray. Head pale yellowish brown, with a prominent longitudinal fascia on the vertex; frons with a black spot which is sometimes confluent with the fascia on the vertex. Eye moderately projected laterally, dark brown. Antenna with two basal joints pale yellowish brown and two apical joints black; first joint longer and thicker than others, with two blackish brown lines beneath; second joint about two-thirds as long as the first; fourth joint slightly shorter than the second, tapering toward the apex; jointlet between second and third joints pale

yellowish brown, same between third and fourth joints black and much shorter than the former. Rostrum passing the anterior coxa, pale yellowish brown; apex of labrum of the same color; the line on the under surface of third and fourth joints entirely black. Pronotum pale yellowish brown with two large spots reaching the anterior margin, which is sinuate; posterior margin moderately so. Meso- and metanotum black with pale yellowish brown lateral sides; the central portion somewhat paler in the male; sternum pale yellowish brown, thickly pubescent. Anterior leg pale yellow; coxa and trochanter very short, the latter with an acute, apical bifurcate spine; femur thick especially so in the male, angularly projected interiorly at the base, inner surface black with minute and delicate dentation; tibia a little shorter than femur, with a distinct spine at the apex, blackish at the tip and on the inner surface; first tarsal joint very short, somewhat spherical in shape; second joint very long, about five times as long as the first, with the apical two-thirds black; claws brown, arising near the base of the second joint. Intermediate leg pale yellowish brown, with the inner margin of trochanter, outer margin and apex of femur, tibia and tarsus dark brown; tibia a little shorter and much thinner than femur, with a fringe of long hairs interiorly, except the basal one-fourth of the length; tarsus two-jointed, first joint a little longer than twice the length of the second, but not furnished with the fringe of hairs which is found in all other species of the genus, second joint with small claws near the apex. Posterior leg much shorter than the intermediate one, pale yellowish brown, with the apex of femur, of tibia and of tarsus dark brown; first tarsal joint about half the length of the second, which is furnished with small claws near the base. Abdomen black above, pale yellowish brown or pale grayish yellow below; sixth segment black with pale yellowish brown anterior margin, about as long as three preceding segments taken together. First male genital segment pale yellowish brown with somewhat greenish horn-like lateral processes beneath; second segment black above with brown posterior margin, pale yellowish brown below.

Female genital segments pale yellowish brown, posterior margin of the penultimate segment and the whole of the last segment black above.

Length of body: ♂ 3 mm., ♀ 3.5 mm.

Holotype, ♂, allotype, ♀, and many paratypes; Ampin near Tainan, South Formosa, Sept. 9, 1921, (Teiso Esaki).

This species is one of the smallest in the genus and is most readily distinguished from other species by the characteristic markings of the head, and by the absence of the fringe of long hairs on the first intermediate tarsal joint. It is somewhat allied to the species of the Genus *Metrocoris* in respect to the structure of anterior femur and tarsus, but the presence of the fringe of long hairs on the intermediate tibia, coloration and general aspect, as well as the marine habitat, make the species more rationally referable to *Halobates* than to *Metrocoris*.

This species is found on a small stream of salt water connecting a pond to the sea, and a large number of specimens swarm in a shaded surface of the stream.

***Halobates shiranui* sp. nov. (Fig. C).**

Body ashy gray, short and broad. Head black with brown pubescence on lateral sides, vertex without markings; eye brown. Antenna black, first joint about as long as the third and fourth joints put together, third and fourth joints nearly equal in length. Rostrum black, reaching the anterior coxa. Pronotum black, anterior margin moderately sinuate, posterior margin very slightly so, distinct transverse impression at the middle of pronotum. Meso- and metanotum together almost as long as broad, swollen and black. Anterior leg black with brown coxa and trochanter; tibia nearly as long as femur; first tarsal joint very short, almost as long as thick, about one-fifth the length of the second joint; claws arising at the middle of the second joint. Intermediate and posterior legs black, femora tapering toward the apex; intermediate tibia a little shorter than femur; first tarsal joint about twice the length of the second;

posterior tibia nearly half as long as femur, tarsus about one-fourth as long as tibia. Abdomen black above, pale brown beneath.

Length of body: 4 mm.

Holotype, ♀, Masaru, near Saseho, Province of Hizen, Japan, on the coast of East China Sea, June 11, 1922 (Mr. Yanagiwara). Type in my collection.

The nearest ally of this species is *Halobates apicalis* n. sp., which is much smaller. These two species are separated from the rest of the genus in having very short first tarsal joint.

***Halobates japonicus* sp. nov. (Fig. B).**

Body black, slightly suffused with ashy gray. Head black with two oblique brown spots near the posterior margin; eye moderately projected, brownish. Antenna black with the apex of the last joint brownish, not longer than the body, first joint subequal in length to the other three joints put together, second and fourth joints nearly equal, third joint much shorter than others. Rostrum black scarcely passing the anterior coxa. Pronotum black, moderately sinuate along anterior and posterior margins, somewhat elevated at the center. Meso- and metanotum black, moderately convex. Prosternum pale brown. Anterior leg black, coxa blackish brown, with pale brown apex; trochanter blackish brown, paler toward apex and base, with a small black spine at the apex; femur very thick in the male; tibia black with the inner surface more or less brownish, shorter than femur, the apical spine angular but not sharply pointed; tarsus black with the first joint shorter than the second, which is furnished with claws near the base. Intermediate and posterior legs black, femora gradually tapering toward the apex; tibiae much shorter and thinner than femora. Intermediate tibia about two-thirds the length of femur, furnished with a fringe of long hairs along the apical two-thirds; first intermediate tarsal joint almost three times as long as the second, with a similar fringe of hairs. First posterior tarsal joint about three-fifths as long as the second, the latter with claws at the middle. Abdomen black, more or

less suffused with brown. The first male genital segment black above with the lateral and posterior portions yellowish brown, dark brown beneath; the horn-like processes slender and very dark in color; second segment yellowish brown beneath.

Length of body: ♂ 5 mm., ♀ 5 mm.

Holotype, ♂, allotype, ♂, and paratypes: Aburatsubo creek near Misaki, Province of Sagami, Japan, July, 1921 (Teiso Esaki). Paratypes: the coast of the Province of Kii (Mr. Takeuchi), the coast of the Province of Tosa (Mr. Takenouchi). Types in my collection.

This species is found rapidly striding on calm water close to the shore near the head of Aburatsubo creek. A few probable examples of this species were observed by me on the Kagoshima Bay, the southernmost portion of Japan proper.

Although resembling *Halobates germanus* White, this species differs from it in its blackish coloration, much larger size, and in the structure of antenna.

Halobates germanus White.

Halobates germanus White, Chall. Rep., Zool., vol. 7, pt. 9, p. 50, pl. 1, fig. 6, 1883. Dahl, Plank, Exp., vol. 2, p. 7, 1893.

Distant, Fauna Brit. Ind., Rhyn., vol. 5, p. 152, 1910.

This species has hitherto been recorded from the following localities: "Celebes Sea," "between the Admiralty Islands and Japan," "Mare della China" (After White), "Andaman Sea" (After Distant). I have not yet found this species near either Japan or Formosa, but have in my collection four specimens of it from Papan, Johore, Malay Peninsula (Mr. Fukushima).

Halobates sericeus Eschscholtz.

Halobates sericeus Eschscholtz, Emtomogr., vol. i, p. 108, 1822. Burmeister, Handb. Entom., vol. 2, p. 209, 1835. Amyot et Serville, Hem., p. 412, 1843. White, Chall. Rep. Zool., vol. 7, pt. 19, p. 47, 1883. Dahl, Plank. Exp., vol. 2, p. 7, 1893.

Oshanin, Verz. Palæ. Hem., vol. I, p. 500, 1908. Van Duzee, Cat. Amer. Hem., p. 432, 1917. Hungerford, Bull. Univ. Kansas, vol. 21, p. 116, 1919.

This species is widely distributed over the Pacific and Atlantic Oceans, and I have examined two specimens from Hawaii, kindly presented to me by Dr. S. Isshiki. Habita: "Many stations on the voyage from the Admiralty Islands to Japan, and from Japan to Honolulu" (White). Oshanin states that "In parte occidentali intertropicali oceani Pacifici, sub. 38 lat. bor. in vicinitate Japoniæ quoque investa species."

***Halobates matsumurai* sp. nov. (Fig. D).**

Halobates sericeus Matsumura (nec Eschscholtz), Thaus. (ns. Japan, Addit., vol. I, p. 27, pl. II, fig. 8, 1913.

Body ashy gray, very sericeous. Head with two brown oblique spots at the posterior margin; eye moderately projected, black. Antenna black with the apical half of the fourth joint brownish, not longer than the body, first joint nearly as long as the remaining three joints put together, second and fourth joints nearly equal in length, third joint shortest. Rostrum shiny black, reaching anterior coxa. Pronotum with moderately sinuate anterior and posterior margins. Anterior leg black; coxa, trochanter, and, in the female, the base of femur pale yellowish brown; femur very incrassate in the male; the apical projection of tibia somewhat acute; first tarsal joint much longer than the second, which is about two-thirds the length of the first and with claws near the base. Intermediate tibia about two-thirds the length of and much thinner than femur; first tarsal joint about four times as long as the second. Posterior tibia about half the length of femur; tarsus one-third of tibia, with the first joint shorter than the second. Body pale yellowish brown beneath. The first male genital segment black above with lateral and posterior portions brown; pale brown or gray beneath; the horn-like processes very slender and black; second segment pale brown beneath.

Length of body: ♂ 5 mm., ♀ 5.5 mm.

Holotype, ♂, allotype, ♀, and paratypes: the coast of Tansui, near Taihoku, Northern Formosa, Sept. 27, 1921 (Teiso Esaki). Paratypes: Takasago, Province of Harima, coast of the Inland Sea of Japan (Prof. S. Matsumura); Shimabara, Province of Hizen, coast of East China Sea (Mr. Yamasaki). Types in my collection.

This species is somewhat allied to *Halobates germanus* White but is much larger in size, more elongated, especially in the female, and has the first anterior tarsal joint much longer than the second.

EXPLANATION OF PLATE V.

A1, *Halobates apicalis* n. sp. A2, antenna. A3, Anterior tarsus A4, Male genital segments, dorsal view.

B1, *Halobates japonicus* n. sp. B2, anterior tarsus. B3, antenna. B4, Male genital segments, dorsal view.

C1, *Halobates shiranui* n. sp. C2, anterior tarsus.

D1, *Halobates matsumurai* n. sp. D2, anterior tarsus. D3, antenna. D4, male genital segments, dorsal view.